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# FEATURE

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## WASTES CAN MEET FEED NEED

by BOB STANLEY

Egypt has a serious shortage of animal protein. Meat is in such short supply that it is on sale only three days of the week. Eggs, milk, and other dairy produce are also in short supply.

Although Egypt is a relatively large country, only about 4 percent of its 387,000 square miles are fit for agriculture — and much of that only under irrigation. Livestock require a lot of space, and that is something that Egyptian farmers obviously do not have.

Worse is the problem of finding sufficient feed, particularly during the long dry summer. Even at present levels of animal production Egypt must import large quantities of feed concentrate, draining the country's foreign exchange reserves. And still it is not enough.

Looking for a solution to this many-sided problem, researchers at the Animal Production Department of the University of Alexandria's Faculty of Agriculture are testing sheep and cattle on a diet that consists largely of garbage — or to be more precise, reprocessed agricultural and industrial wastes.

The idea of using agricultural by-products for animal feed is by no means new, but it has not been attempted in Egypt on a large scale. There is certainly scope for mass production: the country's four main crops (cotton, rice, maize, sugarcane) alone account for more than 8 million tonnes of by-products.

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In addition to these "staples" the Egyptian researchers at the University's experimental farm near Alexandria are testing a bewildering variety of other leftovers. These include pea pods, artichoke leaves, date stones, orange peel, and grape waste from a winery. All those, in fact, together with some molasses, urea, mineral salts, and vitamins make up one of their more successful by-product feed concentrates.

Another combination, comprising orange waste from a local canning factory mixed with pea pods and ensiled for a few months, has been fed to dairy cattle. The result, according to senior researcher Dr A.M. Nour, is an increase in milk production and a reduction in cost. Dr Nour believes this particular mix could reduce the cost of producing a litre of milk by 45 percent. It is also a money saver for the cannery, which previously had to pay someone to take the waste away.

Egypt is justly famous for its cotton. It is the country's main cash crop, so it is not surprising that there should be an abundance of cotton stalks available -- something like 2 million tons of them in fact. Woody and virtually inedible, the stalks can be finely chopped with the aid of a simple grinder. In this form they are quite acceptable as feed, even without any further treatment, and can be further improved as a feed by the addition of a little urea.

The by-products research project began in 1977 with the support of a three-year grant from Canada's International Development Research Centre (IDRC). The researchers have been systematically testing a wide variety of by-products and processing techniques to assess their technical and economic potential.

The final word is not in yet. Although the animal scientist's work is largely completed, there are still important economic studies to be completed. These are complicated by a number of factors. There is the

government's elaborate system of agricultural subsidies, which sometimes distorts real values. It is also necessary to consider the incidental benefits, such as reduction in the cost of waste disposal -- turning a liability into a real asset. And on the deficit side it must also be considered that many of the by-products may already be used for other purposes -- cotton stalks for fuel, straw for making bricks, for example.

At the University farm a pilot feed mill has been built as part of the economic study. It is imported from England, and parts and services are hard to come by, resulting in some unexpected problems and delays. Such a mill is intended to demonstrate the potential for a commercial mill using by-products, and would obviously be beyond the means of most farmers.

The small locally-built grinder stands nearby under a thatched roof supported by poles. It seems to work well, grinding everything from date stones to cotton stalks, and would perhaps be a more practical proposition for a farm large enough to have money to spend on mechanized equipment.

From the point of view of the great majority of small farmers the ensiling techniques developed by the researchers seem to hold the most promise for cheaply converting waste by-products into feed. Necessary equipment here consists only of a pit, some plastic sheeting, and some bales of straw to cover the pit's contents. Egyptian clover, rice straw, elephant grass, and the already-mentioned orange and pea pod mixture, can all be treated this way.

The process is known as microbiological enrichment, and the project leader, Dr Khaled El-Shazly agrees that this is "a beautiful way of doing it". But he points out that the introduction of this process at the farm level would require a large number of highly-skilled extension workers.

Dr El-Shazly strongly believes that their work will be adopted, however. He points out that Egypt has 4.25 million head of cattle and buffalo, and 3 million head of sheep and goats. During the winter and spring they can forage for 95 percent of their needs. But during the six months of summer, green forage provides only 30 percent of their needs, as cotton, corn, and rice take over most of the available land.

Agricultural and industrial by-products amount to not less than six million tons annually of ligno-cellulosic materials, says Dr El-Shazly, of which by far the largest part is presently used for fuel.

He believes a two-pronged approach is needed to meet the shortage. Ways must be found to increase the availability of summer forage (IDRC is also supporting a project in cooperation with the Egyptian Ministry of Agriculture's Animal Production Research Institute aimed at doing just that). Parallel with this development, says Dr El-Shazly, must come the introduction of feeds based on by-products.

The techniques being developed by Dr El-Shazly and his team may have application throughout much of the semi-arid tropics. Researchers from several countries in the region have undergone training as part of the project, which will help to get the message spread around: make feed, not waste!

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